

## **Chapter 8 Data Management**

### **Introduction**

All data collected by the Environmental Monitoring Program (EMP) are stored in digital format for data management and dissemination. Each monitoring element (discrete and continuous water quality, benthic, phytoplankton and zooplankton) has a particular process for data entry, quality control, management and dissemination. All data, except zooplankton and sediment composition can be downloaded via the Internet, from the Bay Delta and Tributaries database (BDAT). At present, the EMP continuous water quality data are available on BDAT under the category "time series."

BDAT consolidates and provides public access to environmental data contributed by more than fifty organizations. The database includes water quality, biological and meteorological data from throughout the San Francisco Estuary's watershed. The EMP water quality, benthic and phytoplankton data stored in this database are available on the Internet at: <http://baydelta.water.ca.gov>.

Information about the various EMP monitoring elements and detailed information about the EMP can be found at:

<http://www.iep.water.ca.gov/emp/>.

Metadata information describing sampling site locations, sampling methodology, and field and laboratory processing for all the data variables is available on the IEP website at:

[http://www.iep.water.ca.gov/emp/metadata\\_index.html](http://www.iep.water.ca.gov/emp/metadata_index.html).

Complete metadata files are available for the benthic, phytoplankton, and discrete water quality monitoring elements of this program. Metadata files are currently being developed for the continuous water quality monitoring elements and the zooplankton. These files also provide contact information for the staff member responsible for each monitoring element.

### **Data Management Procedures**

The procedures for handling each type of EMP data are described below. The description includes: where the data are stored, how the data are checked for quality, what data are available, how to obtain these data, and who is responsible for data management of each monitoring element. Water quality is monitored with both discrete and continuous sampling. The discrete monitoring sites are surveyed monthly, primarily by vessel. The continuous monitoring stations are equipped with automated probes and data recorders that log data every 10 minutes to 1 hour depending on the water quality variable.

## **Discrete Water Quality Data**

During monthly sampling runs, field measurements are recorded on paper datasheets and entered into the field module of the Department of Water Resources' Field and Laboratory Information Management System (FLIMS), using a portable computer. Later, laboratory analyses are performed at DWR's Bryte Laboratory and the results are entered by laboratory staff into the lab module of the FLIMS database. Data are then loaded electronically into the EMP's Discrete Water Quality database, which is a Microsoft Access database. This database is the reference database for this program element. EMP staff periodically reviews the data for accuracy, completeness and consistency against paper datasheet records. Data are then exported electronically to BDAT.

Discrete water quality data from 1975 to present are available for download through the BDAT web interface at: <http://baydelta.water.ca.gov/index.html>.

For more information regarding management and access to discrete water quality data, contact Scott Waller at: [swaller@water.ca.gov](mailto:swaller@water.ca.gov).

## **Continuous Water Quality Data**

Data from automated continuous water quality monitoring stations are retrieved by downloading from each station's data recorders onto a handheld "pocket PC." Upon return to the office, data are loaded into the EMP's Continuous Water Quality database, which is an IBM/Informix database. This database is the reference database for this program element. EMP staff reviews these data for accuracy, completeness and consistency using probe verification and calibration records. Data that are determined to be the result of a measuring instrument that was operating out of proper calibration are flagged as "bad" and are retained in the database. The values of data flagged as "bad" are not available on the BDAT web site but may be obtained from EMP staff upon request.

Continuous water quality data from 1983 to present are available for download through the BDAT interface at:  
<http://baydelta.water.ca.gov/index.html>.

For more information regarding management and access to continuous water quality data, contact Mike Dempsey at: [mdempsey@water.ca.gov](mailto:mdempsey@water.ca.gov).

## **Benthic Data**

Until October 2003, benthic sampling sites were surveyed monthly by vessel. They are now sampled quarterly. Laboratory identification and enumeration of macro-benthic organisms in each sample is performed by Hydrozoology, a private laboratory under contract with DWR. The results are reported to DWR on standard paper datasheets. Laboratory analysis of sediment samples is performed by the DWR's Soils and Concrete Laboratory. The results of the sediment analyses are provided to EMP staff in a written report.

Both sediment and benthic organism data are entered into the EMP Benthic database, which is a Microsoft Access database. This is the reference database for the benthic program element. EMP staff periodically reviews the

data for accuracy, completeness and consistency. Data are exported electronically to BDAT on a quarterly basis.

Benthic data from 1975 to present are available for download through the BDAT web interface at: <http://baydelta.water.ca.gov/index.html>.

Sediment composition data gathered by the benthic monitoring element are exported to BDAT but not yet available for download via the Internet.

For more information regarding benthic or sediment data, contact Karen Gehrt at: [kagehrts@water.ca.gov](mailto:kagehrts@water.ca.gov).

### **Phytoplankton Data**

Phytoplankton sampling sites are surveyed monthly, primarily by vessel. Bryte Laboratory identifies, enumerates, and measures the size of phytoplankton from these samples. These data are entered into the EMP phytoplankton database using Microsoft Access software. This is the reference database for the phytoplankton monitoring element. EMP staff periodically reviews the data for accuracy, completeness, and consistency. Data are then exported electronically to BDAT.

Phytoplankton data from 1975 to present are available for download through the BDAT web interface at: <http://baydelta.water.ca.gov/index.html>.

For more information regarding phytoplankton data, contact Dean Messer at: [dmesser@water.ca.gov](mailto:dmesser@water.ca.gov).

### **Zooplankton Data**

Zooplankton sampling sites are surveyed monthly by vessel. Laboratory identification and enumeration of zooplankton and mysid organisms is performed by the Department of Fish and Game's Central Valley Bay-Delta Branch Laboratory. The results are entered into a computer and stored electronically in a SAS statistical package format. Data are periodically reviewed for accuracy and completeness by DFG staff. Currently zooplankton data are only available through DFG; however, construction of a zooplankton database able to export data to BDAT is underway.

Data are available upon request from Randy Baxter at:  
[rbaxter@delta.dfg.ca.gov](mailto:rbaxter@delta.dfg.ca.gov).

